respectively. Favourable prognostic factors in univariate and multivariate analysis were early stage, tumour size < 4 cm (after adjusting for the residual disease after radiation), no pelvic lymph node involvement and one week gap between EBRT and HDR brachytherapy in three-year DFS (p = 0.001, p = 0.012, p = 0.005, p = 0.005 respectively). The three-year OS rate was 85.7%, 76.4%, 42%, and 33.3% for Stages I, II, III, and IVA, respectively. Favourable prognostic factors in univariate and multivariate analysis were early stage, tumour size < 4 cm, no pelvic lymph node involvement, one week gap between EBRT and HDR brachytherapy and no distant metastasis (during the follow up) in three-year OS (p = 0.001, p = 0.002, p = 0.002, p = 0.002, p = 0.001 respectively).
Conclusions: HDR brachytherapy with Co-60 remote after loading system was successful and it showed HDR brachytherapy in treating patients with carcinoma of cervix was effective after EBRT with acceptable rectal and bladder complications.

110
INTRAOPERATIVE FACTORS ASSOCIATED WITH IODINE-125 PLACEMENT ACCURACY IN PROSTATE BRACHYTHERAPY
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Purpose: The quality of prostate brachytherapy implant depends on accurate placement of seeds in their intended locations. This study will investigate intraoperative factors that potentially contribute to seed placement inaccuracy in prostate brachytherapy.
Methods and Materials: Intraoperative video images of the brachytherapist's hands motion and needle insertions during the implant procedure were acquired for analysis. Using video analysis software, maximum and average insertion velocities were measured. Number of needle insertion attempts and the use of brachytherapist's other hand to manipulate the lateral needle movements were also recorded. Magnitude of seed displacements from their target location were measured in ultrasound images acquired following completion of each implant using VariSeed treatment planning software.
Results: Fifteen patients agreed to undergo this study. 1619 iodine-125 seeds were inserted using 357 needles. 1197 seeds were confidently identified in the ultrasound images and included in the analysis. Mean overall displacement was 0.49 cm (0 to 2.1 cm, 95% CI = 0.48-0.52). Six hundred and fourteen seeds were delivered with a single pass and 583 seeds were delivered with > 1 passes (range 1 to 6). Mean maximum velocity was 12.17 cms-1 (range 4 to 28 cms-1) and mean average velocity was 4.77 cms-1 (range 0.4 to 17.4 cms-1). Seven hundred and forty-seven seeds were delivered with manipulation of the needle by the brachytherapist's other hand. Generalized linear model (GLM) was used to determine the factors contributing to seed displacement and found that maximum insertion velocities < 12 ms-1 was associated with a decrease in seed displacements by 0.049cm compared to maximum speed of > 12 cms-1 (95%CI:-0.09;-0.01, p = 0.0121). Other evaluated factors did not show any no statistically significant correlation with seed displacement: average speed (95%CI:-0.05;0.02, p = 0.4947), lateral manipulation of needle (95%CI:-0.04;0.04, p = 0.9264) and number of needle passes (95%CI:-0.02;0.01, p = 0.8907).
Conclusions: This study identified that needles inserted with lower maximum velocities were associated with less seed displacement. Lateral manipulation of needle, number of passes and average speed did not show statistically significant correlation with the magnitude of seed displacement.

111
PAIN AND OPIOID USE IN GYNECOLOGICAL CANCER PATIENTS TREATED WITH INTERSTITIAL BRACHYTHERAPY
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Purpose: Interstitial brachytherapy (ISBT) implantation has advantages over standard intracavitary techniques in locally-advanced gynecological malignancies. The insertion of implanted catheters directly into tumour tissue enables higher radiation dose conformality and normal tissue sparing. Nevertheless, this procedure can be associated with pain and discomfort because of its invasiveness. The goal of this study is to assess pain and opioid use by patients implanted with a perineal ISBT applicator for treatment with brachytherapy.
Methods and Materials: Thirty-nine patients treated with high-dose rate ISBT using a perineal template from September 2014 to January 2016 were included in a prospective registry trial. Median age was 65 (range 23-88) and the cohort included 13 cervical cancers patients, 11 primary vaginal cancers, 11 recurrent endometrial cancers, one vulvar cancer and three palliative treatments. Patient characteristics (age, obesity, diabetes, use of anti-depressants/anxiolytics) and technical ISBT implantation data (number of needles, depth of implantation and pelvic organ intrusion) were collected. Quantity of opioid use (morphine-oral-equivalent-dose (MoED) per day) and maximum pain scores (0-10) at rest or with movement were evaluated. Paired t-test was used for opioid comparison between first and second implantations. Regression linear analysis was used to identify independent predictors of opioid use.
Results: The majority of patients (34) were initially treated with a course of external beam radiation therapy with a median dose of 45 Gy to the pelvis. Twenty-two patients had a single ISBT implantation while 17 had a second implantation, one week later. The median number of needles used for each implant was 17 (8-26) and a median of three (2-5) fractions of ISBT treatments were delivered. Mean MOeD use per day was statistically higher for the second (55 mg versus 81 mg) procedure as compared to the first insertion (p < 0.05). Maximum pain score at rest or movement was also higher after the second implantation (5/5 versus 7/6). Age (continuous variable) and numbers of implanted catheter needles (dichotomized by median- 17 or less versus > 17) were found to be significant predictors of opioid use for the first procedure. Depth of catheter insertion and pelvic organ intrusion were not correlated to opioid use or pain score.
Conclusions: Interstitial brachytherapy patients require adequate analgesia with opioids after applicator insertion and inpatient stay. The second ISBT implantation is associated with greater opioid consumption and higher median pain scores (moderate versus moderate to severe). The number of implanted needles correlated with increase in opioid use, whereas age had an inverse correlation.

112

Abstract withdrawn

113
MODELS OF CARE FOR CERVICAL CANCER BRACHYTHERAPY IN ONTARIO
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Purpose: Magnetic resonance (MR) is considered the gold-standard imaging modality to guide cervical cancer brachytherapy (BT), however introducing this modality into a BT process can be challenging. The Models of Care Working Group within Cancer Care Ontario's Gynaecological Community of Practice (GYN CoP) of the Radiation Treatment Program focused on developing strategies for Ontario patients to access this technology and expertise. The aim of this study is to identify current models of care for cervical cancer brachytherapy (ccBT)